

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Antenna arrangement comprising:

at least ~~only~~ two antenna element systems each having at least one antenna element, said elements being arranged to be offset with respect to one another, at least in the horizontal direction,

the ~~at least two~~ antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another,

the network having a phase adjusting device connected to receive an input signal, said input signal being split into two output signals with the same intensities but with different phase angles, and

a hybrid circuit, via which the output signals are converted to hybrid output signals which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device.

2. (Currently Amended) Antenna arrangement comprising:

at least ~~two~~ four antenna element systems each being at least one antenna element arranged offset with respect to one another, at least in the horizontal direction,

the at least ~~two~~ four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least two antenna element systems can be supplied with a signal with an intensity or amplitude which can be adjusted relative to one another, said network including a differential phase shifter,

~~further including:~~

wherein the at least one network ~~being~~ is arranged such that a different beam shape is used for receiving signals as compared to transmitting signals.

3. (Currently amended) Antenna arrangement according to Claim 1, wherein the hybrid output signals have the same phase angle ~~or are phase shifted through 180 degrees.~~

4. (Previously presented) Antenna arrangement according to claim 1, further comprising an additional phase adjusting element, which varies the phase angle, is provided between at least one output of the hybrid circuit and at least one input of the antenna system.

5. (Previously presented) Antenna arrangement according to claim 1, wherein the phase adjusting element comprises a differential phase shifter.

6. (Previously presented) Antenna arrangement according to claim 1, wherein the at least two antenna systems have antenna elements which are arranged with a horizontal lateral offset with respect to one another.

7. (Currently Amended) Antenna arrangement according to Claim 6, further comprising at least two antenna columns, the antenna elements of one antenna system being provided in one column, and the antenna elements of the further antenna system being provided in the other column.

8. (Previously presented) Antenna arrangement according to claim 1, wherein the hybrid circuit is formed from a 90° hybrid.

9. (Currently Amended) Antenna arrangement ~~according to claim 1,~~ comprising:

at least four antenna element systems each having at least one antenna element, said elements being arranged to be offset with respect to one another, at least in the horizontal direction,

the at least four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least four antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another,

the network having a phase adjusting device connected to receive an input signal, said input signal being split into at least two output signals with the same intensities but with different phase angles, and

at least one hybrid circuit, via which the output signals are converted to hybrid output signals which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device,

~~further~~ the at least one hybrid circuit comprising at least four hybrid circuits combined to form a Butler matrix, via which a four-column antenna array can be fed, in which an input signal which can be supplied to the input of the phase shifter adjusting device is split into two phase output signals and in that each output of the phase adjusting device is connected to two inputs of the Butler matrix via a respective downstream branching or addition point.

10. (Currently Amended) Antenna arrangement ~~according to claim 1, comprising:~~

at least four antenna element systems each having at least one antenna element, said elements being arranged to be offset with respect to one another, at least in the horizontal direction,

the at least four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another,

the network having a phase adjusting device connected to receive an input signal, said input signal being split into two output signals with the same intensities but with different phase angles, and

at least one hybrid circuit, via which the output signals are converted to hybrid output signals which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device,

~~further~~ the at least one hybrid circuit comprising at least four hybrid circuits combined to form a Butler matrix, via which a four-column antenna array is fed, with a double or multiple phase shifter arrangement being provided, such that the input signal which can be supplied to the input of the network and hence to the phase shifter adjusting device can be divided into four phase shifter output signals, which can be supplied to the four inputs of the Butler matrix.

11. (Cancelled)

12. (Previously presented) Antenna arrangement according to claim 1, wherein the antenna elements are arranged in front of a common reflector arrangement.

13. (Previously presented) Antenna arrangement according to claim 1, wherein the antenna arrangement has antenna elements which transmit and receive in one polarization.

14. (Previously presented) Antenna arrangement according to claim 1, wherein at least two antenna elements are provided and transmit and receive partially in one polarization and partially in a second polarization plane, which is at right angles to the first polarization.

15. (Currently Amended) Antenna arrangement according to claim 1, wherein the dual-polarized antenna elements are aligned at $+45^\circ$ and -45° to the horizontal.

16. (Previously presented) Antenna arrangement according to claim 1, wherein antenna elements are provided which transmit and receive in only one frequency band.

17. (Previously presented) Antenna arrangement according to claim 1, wherein two or more antenna elements are provided which transmit and receive in at least two frequency bands, preferably in at least two polarization planes.

18. (Previously presented) Antenna arrangement according to claim 1, wherein the connecting lines between the outputs of the hybrid circuit and the inputs of the antenna arrangement can be interchanged to produce different horizontal polar diagrams.

19. (Currently Amended) Antenna arrangement according to claim 19, wherein ~~the~~including a connecting line between the outputs of the network ~~is~~in the form of said hybrid circuits and wherein at least some of the inputs of the antenna arrangement are of different lengths.

20. (Previously presented) Antenna arrangement according to claim 1, wherein the network has a receiving path and a transmitting path with at least one receiving network and one transmitting network, via which different horizontal polar diagrams are produced for transmitting and receiving.

21. (Previously presented) Antenna arrangement according to Claim 20, wherein a receiving amplifier and a transmitting amplifier, respectively, are provided in the receiving path and/or in the transmitting path.

22. (Previously presented) Antenna arrangement according to claim 1, wherein the beam shape is adjusted variably.

23. (Currently amended) Method for operating an antenna arrangement, comprising:
providing an antenna system having only first and second columns of antenna arrays; and
varying an input signal via (i) either a phase adjusting device or a phase shifter adjusting device and (ii) a downstream network, such that the signals at the output of the network ~~and thus at the at least two inputs is~~ are either in phase or is are not in phase, preferably with a 180° phase shift; where the signals are input into antenna element systems to control the shape of the
~~provide a~~ horizontal radiation pattern. ~~corresponding to a horizontal polar diagram which is at least one of:~~

- ~~(a) — asymmetric,~~
- ~~(b) — symmetrical and has at least two main lobes which are symmetrical with respect to a vertical plane at right angles to the reflector plane, and/or~~
- ~~(c) — has at least three main lobes or an odd number of main lobes, whose maximum intensities differ from one another by less than 50%.~~

24. (Previously presented) Method for operating an antenna arrangement in particular according to claim 23, wherein:

an antenna arrangement is used which has at least two antenna element systems, which each have at least one antenna element,

the at least two antenna element systems transmit and receive in at least one common polarization plane, and

producing a different beam shape or a different horizontal polar diagram for receiving signals and for transmitting signals.

25. (Previously presented) Method according to Claim 24, including producing, during transmission, a horizontal polar diagram which overlaps the horizontal polar diagram which is produced for reception, with the horizontal polar diagram for transmission having a surface area with a lower power density.

26. (Previously presented) Method according to claim 23, further comprising using a network which has a receiving network and a transmitting network, for setting a horizontal polar diagram which is different for transmission and reception.

27. (Previously presented) Method according to claim 23, further including subjecting the signal which is supplied to the antenna to an additional phase shift, at least upstream of one input.

28. (Previously presented) Method according to claim 23, further including using at least four hybrid circuits, via which a four-column antenna array is fed.

29. (Currently Amended) Method ~~according to Claim 28, for operating an antenna arrangement, comprising:~~

varying an input signal via (i) either a phase adjusting device or a phase shifter adjusting device and (ii) a downstream network, such that the signals at the output of the network are either in phase or are not in phase, where the signals are input into antenna element systems to control the shape of the horizontal radiation pattern,

said radiation pattern having at least three main lobes or an odd number of main lobes,
whose maximum intensities differ from one another by less than 50%,

further including using at least four hybrid circuits, via which a four-column antenna
array is fed, and

further including tapping off two phase shifter output signals at the two outputs of a phase shifter adjusting device, and supplying four resulting signals to four inputs of a Butler matrix.

30. (Previously presented) Method according to claim 23, further including using a double phase shifter arrangement, at whose four outputs four output signals are produced which are supplied to the four inputs of a Butler matrix.

31. (Currently Amended) Antenna arrangement according to Claim 1, wherein the hybrid output signals are phase-shifted through 180°.

32 (New). An antenna arrangement comprising:

exactly two or exactly four antenna element systems each having at least one antenna element, said antenna element systems being arranged in columns offset with respect to one another at least in the horizontal direction,

the two or four antenna element systems commonly transmitting and receiving at least in one common polarization plane,

a network for applying the antenna element systems with signals with an intensity or amplitude which can be adjusted relative to one another, the network comprising a differential phase adjusting device connected to receive an input signal, said differential phase adjusting device and said network splitting said input signal into plural feed signals with the same intensities but with different phase angles, and

a hybrid circuit between said network and said antenna element systems, via which the feed signals are converted to hybrid output signals for coupling to the respective two or four antenna element systems, said hybrid output signals being at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles provided by the differential phase adjusting device.

33. (New). The antenna arrangement of claim 32 comprising exactly four antenna element systems and wherein said hybrid circuit includes a Butler Matrix.